STORM WATER POLLUTION PREVENTION PLAN

KING COUNTY INTERNATIONAL AIRPORT

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Stormwater Pollution Prevention PLAN

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PREPARED BY:

Jeffrey W. Winter, P.E.
Airport Engineer
King County International Airport
P.O. Box 80245
Seattle, WA 98108
(206) 296-7380

Larry Crawford
Skillings

Grants,

KCSlip4 35080

SEA401625

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1.0 INTRODUCTION

The purpose of this Storm Water Pollution Prevention Plan (SWPPP) is to identify areas of potential pollution affecting the storm water as it is discharged from Boeing Field/King County International Airport (BF/KCIA) and to implement operational source control and treatment Best Management Practices (BMP) which will eliminate or reduce the level of pollution entering the storm water.

This SWPPP is being prepared to meet the specific condition in the Airport's Storm Water Baseline General Permit #S03-000343 for the Airport Maintenance Shop as issued by the Washington State Department of Ecology (DOE) on January 20, 1993. See Appendix A for a copy of the permit.

The approach taken in applying for coverage under the Storm Water Permit was to include only the Airport Maintenance Shop and for the Airport to be listed as co-permittees for any permits for tenant businesses.

Most of the emphasis of the SWPPP will pertain to the Airport Maintenance Shop. However, the Airport as a whole and tenant facilities will be discussed in general terms.

2.0 FACILITY DESCRIPTION

2.1 Airport as a Whole

BF/KCIA is a general aviation airport that has about 400,000 operations per year. The Airport is owned and operated by King County as public utility. The site has about 615 acres of which about 435 acres is impervious surface covered by buildings and paved areas. The remaining 180 acres consist in grass and landscape areas.

There are no scheduled air carrier airlines operating at the Airport. United Parcel Service and Burlington Express have air cargo operations. The Boeing Company test flies new aircraft and delivers new aircraft to the various airlines from the Airport. There are a variety of corporately owned business jets and aircraft as well as helicopters which operate on the Airport. The majority of the aircraft operations (80%) comes from smaller single and twin-engined aircraft.

There are about 15 miles of drainage pipe in the Airport storm drainage system. All of the storm water outfalls into the Duwamish Waterway. There are two pumping stations which lift the water and pump it out at two outfalls 03 and 04. There are two gravity lines 02 and 05 which are owned by the Airport. Drainage at the south end of the Airport goes to the Airport's pipe system which connects to a Boeing Company system which interties with a Metro overflow line before it outfalls as 01. There are several off Airport storm water sources (Associated Grocers, Railroad right-of-way, City of Seattle and others) which also come into this pipe system at the south end of the Airport. Outfall 06 which is owned by Seattle City Light primarily drains the old Georgetown Steamplant. Some north end Airport facilities are connected to a storm system 07 owned by the Washington State Department of Transportation which serves the I-5 freeway. Other non-Airport owned properties (Boeing Company, Museum of Flight and City of Seattle) contributes to storm water in a minor way to outfalls 02, 03 and 04. Some Airport property along East Marginal Way South goes into a combination of Boeing Company and City of Tukwila storm drainage systems.

See Map 1 in Appendix B

2.2 Airport Maintenance Shop

The Airport Maintenance Shop located at the northwest corner of the Airport contains the following acreage:

	Acreage
Buildings	0.65
Paved Areas	0.60
Landscape and other non-paved areas	0.44
TOTAL	1.69

A portion of this area (0.65 Acres) drains into the WSDOT storm drain after passing through an oil water separator. The remainder of the site drains to outfall 04 via the northwest pumphouse. See Map 2 in Appendix B.

The activities at the Airport Maintenance Shop include: Storage and handling of various maintenance related materials, vehicle and equipment washing, fuel storage and vehicle fueling, vehicle and equipment maintenance and repair and storage of vehicles and equipment.

2.3 Tenant Facilities

There are a variety of businesses and individuals (230) which lease ground and buildings on the Airport. The Boeing Company leases about 118 acres out of the 270 acres which is leased to tenants. In some cases the Airport leases building and hangar space, but the majority of buildings and hangars are owned by the tenants.

The tenant activities include aircraft manufacturing, maintenance, deicing, fueling, washing, repair, painting and storage. Other non-aircraft related activities include vehicle storage, maintenance, repair, painting, fueling and washing, material storage, loading and unloading, chemical and fuels storage and handling, light manufacturing and nursery.

Letters were sent on August 27, 1992 to the various businesses and agencies on the Airport regarding the Storm Water Baseline General Permit (see appendix C). Fifteen Notice of Intents were submitted by the tenants. Some of the tenants were deemed by DOE not to need a permit by virtue of their Standard Industrial Classification Code. Seven permits were issued by DOE as follows:

Permit #	Business
S03-000478	Flightcraft, Inc.
S03-001116	United Couriers, Inc.
S03-000402	Famco Transport, Inc.
S03-000607	Galvin Flying Service
S03-00345	Aviation Fuel Storage Company
S03-000311	Aero-Copters, Inc.
S03-000226	Boeing Company (North Boeing Field)

A second letter was sent to the tenants on August 10, 1993, informing them about the storm water permit process and reminding those affected to prepare their SWPPP by the November 18, 1993 deadline. Also, a tenant meeting was held on September 17, 1993 to go over the storm water permit process and to discuss solutions. See appendix C.

Recognizing that many other businesses not holding permits at this time, have activities which could affect the storm water quality, the Airport Manager's Office will continue to inform the tenants about these issues and will institute rules and procedures to reduce the pollution potential from the tenant activities to Airport's Storm Water System.

3.0 SOURCE IDENTIFICATION

Industrial activities are identified under two groupings: Airport as a whole and Airport Maintenance Shop. No attempt has been made to identify specific industrial activities done by tenants.

3.1 Airport as a Whole

3.1.1 Historical Spills and Leaks

Even with the numerous aircraft and vehicle fueling activities that take place at the Airport on a daily basis, significant spill occurrences are infrequent. The Airport Fire Department maintains records on fuel spills. These records were reviewed back to November 1991. The fuel spill reports can be found in Appendix D.

In 1985 there was a 10,000 gallon spill at Flightcraft while fueling a truck. This was contained at the Southwest Pumphouse and the fuel pumped out. In 1987 and 1988 there were two 1,200 gallon fuel spills at the north fuel storage area. Both were mostly contained and the fuel retrieved.

Review of spill records indicate that a total of 22 fuel releases ranging in quantity from 1/2 gallon to 50 gallons have been reported at the Airport since November 8, 1991. The materials spilled consist primarily of jet fuel, diesel and gasoline. Airport clean-up methods for fuel spills include the use of absorbent materials, vacuum pump or hose down some spills may have entered the storm drainage system.

Fuel spill response procedures by the Airport Fire Department are constantly being improved. The Airport's current policy on fuel spills is to remove the fire hazard, contain the spill, then start cleanup where possible, the person responsible for the spill must do the cleanup. The Airport Fire Department daily checks the tenants fuel trucks and fuel storage tanks for leakage. Also, they monitor the Airport for aircraft leaking fuel through their overflow vents and for illegal dumping of oils and hydraulic fluids.

Many old underground storage tanks have been removed in recent years. One 1,700 gallon fuel oil tank near the Terminal Building had leaked and was removed with some contaminated soil in 1987. Another fuel oil tank removed in the Firestone site in 1989 also had leaked so the contaminated soil was removed. Another leaky tank was removed at the Airport Maintenance Shop in 1993. See section 3.2.1 for more information on the Shop tank.

3.1.2 Potential Pollutants in Storm Water

Based upon the present activities at the Airport the potential pollutants that may be present in the storm water discharges would consist primarily of petroleum products such as fuels oil and greases. Small amounts of heavy metals and detergents may also be present as well as pesticides and herbicides. Some siltation may enter the storm water in unpaved areas.

Here is a table showing these potential pollutants and their source:

POLLUTANT	SOURCE
Petroleum Hydrocarbons	Aircraft and Vehicle Storage Outside Aircraft and Vehicle Maintenance
Detergents/Solvents	Aircraft and Vehicle Washing
Metals (Aluminum, Antimony Barium, Chromium, Iron Magnesium Selenium, etc.)	Outside Aircraft Maintenance
Siltation	Unpaved Areas
Ethylene Glycol	Aircraft Deicing

Specific areas of the Airport where select industrial activities occur are the most likely for potential pollutants to enter storm water. These consist of the following:

- Aircraft, Vehicle and Equipment Storage and Maintenance
- Aircraft and Vehicle Fueling
- Aircraft and Vehicle Washing
- Aircraft and Pavement Deicing
- Material Loading/Unloading
- Chemical and Fuel Storage
- Building and Grounds Maintenance

A brief description of the nature of activities in these areas of pollutant contact at the Airport is described in the next few sections.

3.1.3 Aircraft, Vehicle and Equipment Storage Maintenance

Aircraft, vehicles and/or equipment are stored and maintained by the majority of tenants at the Airport. Approximately 550 aircraft are stored outside in tiedown locations, and approximately 135 aircraft are stored in hangars most of which contain no floor drains. Minor spills of lubricating oils, hydraulic oils, degreasers that are common when maintaining aircraft are appropriately cleaned up with absorbents and represent limited potential for significant pollutant discharge.

The majority of aircraft, vehicle and equipment maintenance activities are conducted indoors. At some tenant facilities, the runoff that discharges through the floor drains runs directly to oil/water separators before entering the sanitary sewer system. Some pilots do minor maintenance work on their aircraft while it is parked in their outside tiedown stall.

3.1.4 Aircraft and Vehicle Fueling

Aircraft fueling is done all over the Airport from fuel trucks which get their fuel from underground storage tanks. The total of fueling done in 1992 was 10,755,000 gallons Jet A and 2,287,000 gallons AvGas.

Diesel and gasoline fuel loading into underground storage tanks and from the tanks into the fuel trucks is conducted via a closed hose transfer connection. This closed hose approach is also used when jet fuel is loaded into large jet aircraft. Fueling from the trucks into the other aircraft require a person holding the nozzle. Fuel spills occur infrequently with few spills discharging into the storm drain. Most spills are contained by absorption materials and vacuum pump clean-up methods. A history of fuel spills dating from November 8, 1991 to the present was presented previously in Section 3.1.1.

3.1.5 Aircraft and Vehicle Washing

Designated and non-designated vehicle, aircraft, and equipment wash areas are located at the Airport. Designated wash areas are located in specific locations and generally contain a wash rack and an oil/water separator to collect the runoff. The runoff is then routed to the sanitary system. Non-designated wash areas appear to be the primary source of non-storm water discharges to the storm system.

Currently there are 3 designated was pads for smaller aircraft maintained by the Airport. There are also two small wash pads and one large jet wash pad owned by tenants. In addition some of the hangars have floor drains which are piped into the sanitary sewer system and thus could be used for aircraft washing.

3.1.6 Aircraft and Pavement Deicing

Deicing and anti-icing are performed on aircraft to minimize the ice build-up on the wings and plane body during cold weather conditions. A limited amount of deicing materials is used at the Airport due to the moderate weather conditions in Western Washington and the limited number of aircraft that have to meet schedules.

Two fixed base operators perform limited aircraft deicing for their customers - Galvin Flying Service and Flightcraft. United Parcel Service is the primary user of deicing chemicals for their larger jets. Only the Boeing Company has an area designated for deicing where the materials can be contained.

The primary aircraft deicing material used at the Airport contains ethylene glycol or Propylene Glycol. There is no current clean-up procedure at the Airport for releases of deicing materials. In comparison to airports located in colder climates (i.e. the East Coast or the Mid-western regions and those with scheduled airlines. The Airport uses relatively low volumes of deicing and anti-icing materials and significant runoff from their activity is not expected. For example Seattle Tacoma Airport estimates in usage of ethylene glycol in 1992 to be 400,000 gallons. In contrast Boeing Field used about 1,500 gallons in 1992.

Very little pavement deicing is done. To date no deicing chemicals have been used on the aircraft movement areas. The Airport Shop has 1,000 pounds of Calcium Magnesium Acetate pellets to be used as needed. About 200 pounds per year of rock salt is mixed with sand to deice asphalt roads. About 500 pounds per year of urea is used to deice concrete sidewalks and roads.

3.1.7 Material Loading/Unloading

Various chemical products (i.e. oils and waste oils) are regularly transferred to and from tenant facilities at the Airport daily. These loading/unloading areas may consist of loading docks at buildings or outdoor storage and transfer facilities such as at the fuel farms. During chemical and petroleum product loading, spills as well as leaks and/or residues on the exterior of the drums or containers could occur resulting in pollutants entering the storm drains. Other than fueling, material loading/unloading activities are deemed to have insignificant impact on the storm water.

3.1.8 Chemical and Fuel Storage

Large quantities of chemical and petroleum products (i.e. gasoline, diesel and jet fuels) are stored by tenants at the Airport. Many tenants have separate covered and outdoor storage facilities to house these items. On-site fuels are stored outdoors in underground and above ground storage tanks. Chemicals, oils and waste oils may be stored indoors or outdoors in 55-gallon drums. Other materials such as cleansers, paints and paint related products are stored in containers located indoors and outdoors, either on the ground or in cabinets. During the winter rain season, any residues on the containers or residuals from chemical or leaks in outdoor storage areas are potential sources that could contribute to pollutants in storm water discharges. Tenants will be encouraged to put all of the miscellaneous chemical items under cover.

Here is a listing of the fuel storage at the Airport.

AIRPORT FUEL STORAGE
(Number and Size of Tanks in Gallons)

TENANT	AIRCRAFT	VEHICLE		
	Jet A	Av Gas	Diesel	Unleaded Gas
Aerocopters	1 - 10,000			
Air National Guard			2 - 5,000	1 - 5,000
Aviation Fuel	8 - 20,000		2 - 20,000	1 - 12,000
Boeing Company	2 - 10,000 4 - 12,000 (JP-8) 1 - 5,000	1 - 5,000	1 - 300	1 - 3,000
Flightcraft	2 - 15,000	1 - 12,000		1 - 3,000
Nordstrom	2 - 15,000			
TOTALS (GALLONS)	303,000	17,000	50,300	23,000

3.1.9 Building and Grounds Maintenance

Pesticide and herbicide products such as Roundup, Surftan, Crossbow, Cassaron, and Malaithion are applied at select areas at the Airport to inhibit the growth of weeds and to eliminate insects. The Airport Maintenance Shop has one worker licensed to apply pesticides and herbicides. These products are stored indoors in various types of containers. Pesticides and herbicides are not applied if rain is forecasted.

Weed and Feed and organic fertilizers are used only in landscaped areas in our parks, entrance areas and near buildings. None of the airfield grass areas are fertilized.

3.2 Airport Maintenance Shop

3.2.1 Historical Spills and Leaks

There has been no significant spills of materials which would have affected the storm water at the Airport Maintenance Shop. However in 1993 two 1,000 gallon underground fuel tanks were removed. The tanks had leaked fuel so about 600 cubic yards of contaminated soil was removed. Ground water monitoring wells have been installed.

3.2.2 Potential Pollutants in Storm Water

Based upon the present activities at the Airport the potential pollutants that may be present in the storm water discharges would consist primarily of petroleum products such as fuels oil and greases. Small amounts of heavy metals and detergents may also be present as well as pesticides and herbicides. Some siltation may enter the storm water in unpaved areas.

Here is a table showing these potential pollutants and their source:

POLLUTANT	SOURCE
Petroleum	Vehicle Storage
Hydrocarbons	Outside Vehicle Maintenance
Detergents/Solvents	Vehicle Washing
Metals (Aluminum, Antimony Barium, Chromium, Iron Magnesium Selenium, Etc.)	Outside Vehicle Maintenance
Siltation	Unpaved Areas

Specific areas of the Airport where select industrial activities occur are the most likely for potential pollutants to enter storm water.

These consist of the following:

. Vehicle and Equipment Storage and Maintenance
. Vehicle Fueling
. Vehicle Washing
. Material Loading/Unloading
. Fuel Storage
. Material Storage

A brief description of the nature of activities in these areas of pollutant contract at the Airport is described in the next few sections.

3.2.3 Vehicle and Equipment Storage and Maintenance

While the majority of the Maintenance vehicles and equipment is stored inside buildings, employee vehicles and large vehicles and equipment are stored outside.

In rain events residual petroleum products on pavements where vehicles are stored as well as direct contact to mechanical systems in the case of maintenance equipment can lead to storm water pollution.

Most vehicle and equipment maintenance and repair work is done inside the auto shop area of the building. However, larger equipment is worked on outside because they can't be brought indoors.

3.2.4 Vehicle Fueling

Gasoline and diesel fueling is done at the above ground storage tank area. This area is outside and at present no means of containing larger spills exists. The tanks have a seven gallon overspill containment feature for filling spill protection.

3.2.5 Vehicle Washing

Maintenance vehicles are presently washed outside on the north side of the shop building. Since a room exists in the auto shop area with a floor drain tied to the sanitary sewer system, vehicle washing can be done there so as to not contaminate the storm water. Occasionally steam cleaning is done outside.

3.2.6 Material Loading/Unloading

Various chemical products (i.e. oils and waste oils) are occasionally transferred to and from the Airport Maintenance Shop. These loading/unloading activities are done both inside and outside the Maintenance Shop. During chemical and petroleum product loading, spills as well as leaks and/or residues on the exterior of the drums or containers could occur resulting in pollutants entering the storm drains. Other than fueling, material loading/unloading activities are deemed to have insignificant impact on the storm water.

3.2.7 Fuel Storage

The two 1,000 gallon above ground fuel storage tanks (unleaded gasoline and diesel) are uncovered. The tanks have a seven gallon overspill containment feature for filling spill protection. The tanks are double lined with a monitoring tube to detect if the primary tank has leaked.

A 1,750 gallon underground heating oil tank provided secondary fuel for the Maintenance Shop's low pressure steam boiler. The fuel is seldom used so very little filling of the tank is done.

A recently decommissioned 1,000 gallon underground tank stored diesel fuel. It was replaced by the above ground tank. This tank will be removed in January 1994.

An above ground propane tank stores fuel for the crack filler tar pot.

3.2.8 Material Storage

A variety of maintenance related materials are stored outside at the Maintenance Shop. These include:

ITEM	CONTAINERS (GALLON)
Traffic Line Paint	55
Roofing Tars and Coatings	5 and 55
Sealcoat	55
Waste Oil	55
Miscellaneous Paint, Thinners	1 and 5
Light Ballast with PCB's	55
Gravel, Bark	Open Bins

Efforts will be made to reduce the quantities of these materials and to put them undercover or inside buildings to minimize the potential for pollution to the storm water.

3.3 Non-Storm Water Discharge Identification

In order to determine if non-storm water discharges exist at the Airport, the following steps were used in the initial phase of the program.

1. Site investigation conducted in the dry season.

2. The piping records drawing is being updated and put on Autocad.

3.3.1 Field Investigation

Airport Engineer Jeff Winter inspected all of the outfall pipes on September 13/20, 1993. Here are the observations for the various outfalls:

OUTFALL	NOTES
01	No direct observation done, only surface water enter this pipe system from the Airport. The majority of runoff contributing to this system comes from off Airport properties
02	About one inch deep clearwater flowing out of the 27" pipe. No presence of oils or sudsy water noted. An upstream manhole was inspected and a slight water flow was observed.
03	A small amount of water was flowing out the pipe as a residual to a pumping cycle. A pump in the southwest pumphouse was manually turned on. Seven minutes later the water came out to a depth of nine inches ± in the 48" pipe. The water was the color of butterscotch but no oil or suds were noted. After reviewing the pump records, the pumps had been coming on one cycle every 1.5 days, the pumps would run 0.4 hour per cycle so the average daily flow is calculated to be 96,000 gallons per day. While looking for sources of water, aircraft washing was observed at a few locations. Also, a portion of the piping has previously had groundwater infiltration problems. The extent of any infiltration will be studied further using field observations and tv scanning of certain pipes. There is one old hangar at 7585 Perimeter Road which has floor drains which are connected to the storm system. The tenant has been so notified. This situation is being studied to divert the outflows from the drains to a sanitary line. The X-Ray, Inc. building at 7500 Perimeter Road has a floor drain in the warehouse tied to the storm line. At he present only an occasional floor rinsing using a garden hose would affect the storm water. A cooling tower on the east side of the Boeing EMF (3-962) building has non-contact cooling water which flows into the storm system.
04	A pump was turned on manually at the northwest pumphouse. The water observed coming out the spillway was light brown without any oil or suds noted. Based upon the pump records the average pumping cycle lasts 0.21 hour and the pumps come cycle on about 2.6 times per day in the dry season. thus about 78,000 gallons per day flows on average. Irrigation water from the Rosso Nursery at the north end of the Airport enters the storm system. There may be illicit connections from the various Boeing Company facilities in the northwest corner of the Airport contributing to this dry weather flow. Further field investigation work will be done.
05	No dry weather flows were noted on this gravity line.

3.3.2 System Mapping

The Airport has been creating an updated storm drainage drawing. This drawing is being done on Autocad. A review of past construction drawings, other drainage maps and some field investigation was done to make the drawing accurate. Since the Airport Engineer has been at the Airport for 23 years, there is first hand knowledge of any storm drainage systems changes and additions during that time.

The records do show overflow connections from each of the City of Seattle lift stations on their sanitary sewer system which serves the east side of the Airport. Any flow in these overflow lines would be infrequent and short in duration. No other illicit connections were found during the development of the updated drainage map.

4.0 STORM WATER MANAGEMENT CONTROLS

A storm water Best Management Practice (BMP) is defined as any program, technology, process, siting criteria, operating method, measure or devices which controls, removes or reduces pollutants originating from industrial sources. Appropriate BMPs are selected for industrial facilities based on a site assessment. Areas of actual or potential pollutant contact are evaluated and applicable BMPs implemented to eliminate or minimize the pollutants.

Quality control BMPs are designed to limit the types and concentrations of pollutants found in storm water runoff. Quality control BMPs can be subdivided into source control BMPs and treatment control BMPs. Source control BMPS are intended to prevent pollutants from entering surface waters by altering activities so as to eliminate or minimize pollution produced as a result of the activity. Source control BMPs are typically operational practices that prevent pollution by reducing potential pollutants at the source. Examples of source control BMPs include:

- Move an outdoor operation indoors.
- Place storage containers for recyclable oil in a shed or under a lean-to.
- Store hazardous materials/wastes in covered, contained areas.

Treatment control BMPs treat the storm water to remove pollutants. Treatment BMPs include:

- Catch Basins
- Oil/Water Separators
- Grass Swales

A properly designed and implemented spill response program can also be an effective method for controlling storm water quality. Spill response programs rely upon employee awareness and training to be effective.

4.1 Existing Control Mechanisms

The Airport has eight gravity oil/water separators placed at various locations on the storm lines coming from the east side facilities. There are also two coalescing plate oil separators. The Boeing Company has seven oil/water separators at their facilities on the Airport. Most of the separators are piped with a control manhole which diverts the first and low storm water flows through the separator. Higher flows spill over a weir to by pass the separator so as to not flush out the trapped oils.

Many of the catch basins have 90° elbows on the outlet pipe. This helps to trap sediment and oils in the catch basin. Absorbent booms are placed in the pit wells for the two pumphouses to capture oils in the storm water. The Airpark Hangar site has a grass filter strip to filter storm water runoff from the auto parking area.

In addition the Airport has placed barrels for the collection of waste oil, solvents and other miscellaneous petroleum products at its aircraft tiedown aprons. These help prevent dumping of these products down the storm drain.

The Airport has a program to inspect and maintain its oil separators. See Appendix E for a copy of the oil separator maintenance program. All of the separators were cleaned out in September 1993, and both oily liquids and sediments will be removed.

Also, the Airport has cleaned the sediment out of catch basins and storm drain lines and the two pumping stations on a periodic basis. Up to this point this has been done more to keep the water flowing than to prevent siltation. However, a more comprehensive and regular cleaning program will be started to reduce the siltation of the storm water entering the Duwamish Waterway. This will also reduce the transportation of heavy metals in the storm water.

4.2 Operational Best Management Practices

4.2.1 Pollution Prevention Team

The following people have been identified to make up the Pollution Prevention Team:

A. Jeffrey W. Winter, Airport Engineer, Team Leader
Responsibilities: Develop and maintain storm water permit documents including SWPPP, organize implementation of BMPs monitor tenant's storm water permit compliance.

B. Robert Nonas, Maintenance Manager, Hazmat Coordinator
Responsibilities: Oversee operation of Maintenance Shop activities, insure proper handling and disposal of hazardous materials.

C. Gary Olson, Police Chief, Spill Response Coordinator
Responsibilities: Oversee responses to spills, monitor tenant and user activities affecting the storm water.

4.2.2 Good Housekeeping

Good housekeeping involves a common sense approach to improve and maintain a clean and orderly work environment. The goal of good housekeeping is to prevent or significantly reduce the pollutants that enter the storm water. The following items make up the Airport's good housekeeping BMP:

1. Review material storage practices to reduce exposure of materials to storm water.
2. Identify and properly label chemical materials which may be hazardous to the storm water if released.
3. Dispose of materials not needed.
4. Schedule routing cleanup operations.
5. Maintain well-organized work areas.
6. Train employees on good housekeeping practices.
7. Address spills quickly.

4.2.3 Preventative Maintenance

The Airport will perform routine inspections of storm water drainage and treatment systems and equipment (tanks, containers and drums) to insure proper operation and integrity. See BMP SC8 in Appendix F. Proper maintenance of these systems and equipment can reduce the contamination of the storm water should these systems fail.

4.2.4 Spill Prevention and Emergency Cleanup

The primary focus of spill prevention involves the various fueling activities since the volumes of fuel handled is large. Of secondary importance is the storage and handling of various chemical materials. See Appendix D for a description of the Airports Spill Prevention and Emergency Cleanup plans.

4.2.5 Employee Training

Employee training is essential to effective implementation of the SWPPP. The purpose of a training program is to inform personnel at all levels of responsibility the components and goals of the SWPPP. When properly trained, personnel are more capable of preventing spills, responding safely and effectively to an accident when one occurs, and recognizing situations that could lead to stormwater contamination.

The Airport will develop an annual employee training program that covers such topics as spill prevention and response, good housekeeping, material management practices, and other appropriate topics.

4.2.6 Inspections and Recordkeeping

Two inspections will be conducted per year -- one during the wet season and the other during the dry season. A report summarizing the scope of each inspection, the personnel conducting the inspection, the date(s) of the inspection, major observations relating to the implementation of the SWPPP, and any modifications made to the SWPPP as a result of the inspections will be included in the SWPPP.

1. The wet season (October 1 - April 30) inspection shall be conducted during a rainfall event to verify that the description of potential pollutant sources is accurate, the site map reflects current conditions, and the controls to reduce pollutants in stormwater discharges identified in the SWPPP are being implemented and are adequate. The wet-weather inspection shall include observations for the presence of floating materials, suspended solids, oil and grease, discolorations, turbidity, odor, etc. in the stormwater discharge(s).

2. The dry season (May 1 - September 30) inspection is for the purpose of identifying flows of unpermitted non-stormwater discharges such as domestic wastewater, non-contact cooling water, or process wastewater to the stormwater drainage system.

The following elements make up the inspection and reporting procedure:

. Qualified, trained Airport personnel to regularly inspect the facility's equipment and areas, track results of inspections, make necessary changes, and maintain records of all inspections.

. Inspection records will not when inspections were done, who conducted the inspection, what areas were inspected, what problems were found, and what steps were taken to correct any problems. These reports will be signed and kept with the SWPPP.

. Stormwater drainage areas will be inspected for evidence of pollutants entering the drainage systems.

. The effectiveness of BMPs will be evaluated.

. Structural measures, sediment controls, and other stormwater BMPs will be observed to ensure proper operation.

. Should inspections reveal potential pollutant sources or the SWPPP measures and controls are inadequate, then the SWPPP will be modified in a timely manner.

4.3 Source Control Best Management Practices

Source control BMPs are everyday operational practices, that prevent pollution by eliminating reducing potential pollutants at the sources. The source control BMPs (designated as SC#) are listed below with complete descriptions of each source control BMP to be found in Appendix F.

SC1 Elimination of Non-Storm Water Discharges to the Storm Drainage System
SC2 Vehicle and Equipment Maintenance and Repair
SC3 Vehicle and Equipment Fueling
SC4 Vehicle and Equipment Washing and Steam Cleaning
SC5 Waste Handling and Disposal
SC6 Outdoor Container Storage
SC7 Outdoor Container Storage
SC8 Maintenance of Storm Drainage Facilities
SC9 Grounds Maintenance
SC10 Storm Water Pollution Prevention Education

STORM WATER BEST MANAGEMENT PRACTICES AND
CORRESPONDING TARGED AIRPORT MAINTENANCE

	STORM WATER BEST MANAGEMENT PRACTICES									
ACTIVITY	SC1	SC2	SC3	SC4	SC5	SC6	SC7	SC8	SC9	SC10
VEHICLE STORAGE						X	X	X		X
VEHCILE MAINTENANCE		X			X		X	X		X
VEHICLE FUELING			X					X		X
VEHICLE WASHING	X			X						X
LIQUID HANDLING						X	X	X		X
FUEL STORAGE					X	X		X		X
CHEMICAL STORAGE					X	X	X	X		X
PESTICIDE STORAGE					X	X	X	X		X
EQUIPMENT CLEANING	X			X						X
EQUIPMENT MAINTENANCE		X			X		X	X		X
EQUIPMENT FUELING			X					X		X
EQUIPMENT STORAGE						X	X	X		X
GROUNDS MAINTENANCE	X							X	X	X

__X__ BMP APPLICABLE _____ BMP NOT APPLICABLE

STORM WATER BEST MANAGEMENT PRACTICES LEGEND

SC1 Elimination of Non-Storm Water Discharges to the Storm Drainage System
SC2 Vehicle and Equipment Maintenance and Repair
SC3 Vehicle and Equipment Fueling
SC4 Vehicle and Equipment Washing and Steam Cleaning
SC5 Waste Handling and Disposal
SC6 Outdoor Handling of Liquid Material
SC7 Outdoor Container Storage
SC8 Maintenance of Storm Drainage Facilities
SC9 Grounds Maintenance
SC10 Storm Water Pollution Prevention Education

4.4 Erosion and Sediment Control Best Management Practices

The Airport is generally flat with surface slopes ranging from 0-5% with most operational areas at 1-2%. The non-paved areas generally have grass or other landscaping. Thus there is little erosion potential except when areas are disturbed for construction work. Also, the sandy silt soils tend to absorb the rain water.

During construction work the following erosion and sediment control BMPs found in Appendix G and excerpted from the Department of Ecology Storm Water Management Manual for the Puget Sound Basin dated 2-92 should be used.

E1.10 Temporary Seeding of Stripped Areas
E1.15 Mulching and Matting
E2.10 Stabilized Construction entrance and Tire Wash
E3.30 Storm Drain Inlet Protection

4.5 Treatment Control Best Management Practices

Treatment control BMPs are methods where the storm water is treated to remove pollutants. Treatment control BMPs, even if properly constructed and maintained, are not 100 percent effective. Because of space limitations and operational safety concerns it would not be feasible to use biofiltration swales and wet ponds on the Airport as treatment control BMPs. However, the large grass areas adjacent to the runways and taxiways act as vegetation filter strips. The most practicable treatment BMP for the Airport is the oil/water separator.

See Appendix H for a description of oil/water separators excerpted from the Department of Ecology Stormwater Management Manual for the Puget Sound Basin dated 2-92.

4.6 Implementation Schedule

Implementation of non-capital BMPs is required by November 18, 1994 in accordance with the Baseline Permit. Implementation of capital improvements is required by November 18, 1995. Non-capital BMPs are those BMPs such as operational and source control BMPs that may include sweeping, moving an activity under cover, or those activities which do not meet the definition of capital improvements.

Capital improvements means the following improvements which will require capital expenditures:

1. Treatment BMPs, including but not limited to: biofiltration systems including constructed wetlands, settling basins, oil separation equipment, and detention and retention basins.

2. Manufacturing modifications, including process changes for source reduction, if capital expenditures for such modifications are incurred.

3. Concrete pads and dikes and appropriate pumping for collection of storm water and transfer to control systems, from manufacturing areas such as loading unloading, outside processing, fueling and storage of chemicals and equipment and wastes.

4. Roofs and appropriate covers for manufacturing.

The following tentative schedule is given for implementation of non-capital BMPs:

Date	Item
12-93	Follow up on tenant compliance with preparation of SWPPPs.
1-94	Shop material storage improvements.
3-94	Review and implementation of SWPPP training for Airport personnel.
6-94	Budgeting for Capital Improvements for 1995 (oil separators, shop fueling area improvements, wash pads, etc.)
6-94	Annual SWPPP training meeting with tenants.
11-94	Other BMPs implemented.

An annual inspection of tenant facilities will be conducted by Airport personnel to verify that all SWPPP elements are properly implemented at the facility. It is recommended that tenant SWPPP coordinators conduct at least semi-annual inspections of their facilities and maintain records of these inspections to ensure the BMPs have been properly implemented. The personnel designated and trained to implement the SWPPP will perform the joint annual inspection and provide the Airport SWPPP coordinator with complete and accurate information. Any observations requiring a response made during the annual inspection (and the resulting response) will be documented and incorporated into the SWPPP. All inspection records will be retained for at least five years.

SWPPP Content Review

SWPPP elements will be reviewed annually as described above. Any necessary revisions to the SWPPP, based on the facility inspections, will be documented and incorporated. The SWPPP will also be amended at this time if there has been a change in construction, operation, or maintenance which may affect the discharge of pollutants to surface waters, ground waters, or the storm drain system. Individual tenants are required to notify the Airport as early as feasible when contemplating any such changes. The SWPPP will also be amended at any time it is found to be not adequately addressing conditions of the Department of Ecology Baseline Permit or any amendment to the Permit. The SWPPP will also be modified if it has not achieved the general objectives of controlling pollutants in storm water.